

Investigation of Ocular Manifestation in Patients Diagnosed with Multiple Sclerosis Based on the Manifestation and Demographic and Geographic Data

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Abstract Introduction: Multiple sclerosis (MS) is an autoimmune inflammatory condition which attacks and demyelinate central nervous system neurons with variable degree which causes significant disability in these patients. In this study, we plan to investigate ocular manifestation and prevalence of these symptoms in patients diagnosed with MS. Methods: We have enrolled 100 patients with confirmed diagnosis of MS, in a retrospective study from neurology clinic of a private hospital in Tehran, from 2015 to 2016. We have reviewed the thorough neurological examination and visual assessment of these patients. Also, demographic data of these patients were recorded for further analysis. We have performed statistical analysis using SPSS version 16 and Student T-test and Chi-square test for variables analysis. Results: Of all patients, 85 cases were female and 15 were male, with mean age of 35.2 years. We have found atrophy of the disc followed by optic neuritis in 32% and 19% respectively. Also, retrobulbar neuritis and papillitis were among less common manifestations, counting as 13% and 8% respectively. Most of the ocular manifestation were consistent with some demographic and geographic factors, such as age (most common in patients under 34 years old), female gender and patients not living in city areas. Also, patients with their disease initially started less than 22 years showed increased frequency of nystagmus and optic disc atrophy, while defect in color vision were more common in patients with initial disease initiation after 22 years old (P value < 0.05). Conclusion: Patients with MS may have various presentations of neurological abnormalities, which ocular manifestations is one of the most important and initial warning signs. We have found that optic disc atrophy and optic neuritis are among the most common presentations of MS, and neurologists should consider demographic and geographic parameters of patients.

Keywords: multiple sclerosis, ocular manifestation, optic disc atrophy, optic neuritis, demographic data, geographical data

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1. Introduction

Multiple sclerosis (MS) is an immune-mediated inflammatory disease that attacks myelinated axons in the central nervous system (CNS), destroying the myelin and the axon in variable degrees. [1] In most cases, the disease follows a relapsing-remitting pattern, with short-term episodes of neurologic deficits that resolve completely or almost completely. [2] It is diagnosed based on clinical findings and supporting evidence from ancillary tests, such as magnetic resonance imaging (MRI) of the brain and cerebrospinal fluid (CSF) examination. [3] Immunomodulatory agents consists the therapy for the underlying immune disorder and management of symptoms, as well as non-pharmacologic treatments, such as physical and

occupational therapy. MS may present itself with various types of neurological manifestation, ranging from CNS to spinal cord disorders. [4] However, ocular manifestation is one of the most terrifying and initial presentation of MS in these patients, thus we plan to investigate ocular manifestation and prevalence of these symptoms in patients diagnosed with MS, as well as relevant demographic and geographic factors.

2. Methods

From 2015 to 2016, we have retrospectively entered patients referred to neurology clinic of a private hospital in Tehran with confirmed diagnosis of MS. We have excluded patients with underlying active malignancy at their MS evaluation, history of previous cranial radiotherapy,

patients with history of ocular surgery and any relevant ophthalmologic problems, patients with missing data regarding their thorough neurological examination as well as ocular examination including fundoscopy and patients with missing data of their geographical status and demographic data were excluded from study. Diagnosis of these patients was confirmed using neuro-imaging modalities such as MRI and also CSF analysis in suspected patients. We have utilized SPSS version 16 for statistical analysis, as well as Student T-test and Chi-square test for evaluation of variables.

3. Results

After performing the exclusion criteria, we have enrolled 100 patients; consist of 85 females with mean age of 35.8 (ranged between 18.2 years old and 42.1 years old) and 15 males with mean age of 33.4 years (ranged between 25.3 years old and 39.2 years) in this retrospective study. We have found atrophy of the disc followed by optic neuritis in 32% and 19% respectively. Also, retrobulbar neuritis and papillitis were among less common manifestations, counting as 13% and 8% respectively. Most of the ocular manifestation were consistent with some demographic and geographic factors, such as age (most common in patients under 34 years old), female gender and patients not living in city areas. Also, patients with their disease initially started less than 22 years showed increased frequency of nystagmus and optic disc atrophy, while defect in color vision were more common in patients with initial disease initiation after 22 years old. (P value < 0.05) Also, we have found that patients more than 26 years old suffered more diplopia than patients less than 26 years old, which was statistically significant. (P value < 0.05).

4. Discussion

Prevalence of MS in United States of America is reported to be from 58 to 95 per 100000 in general population. Presentation of MS varies based on ethnicity, geographical features and also genetic of the patients. [5] Some patients have a predominance of cognitive changes, while others present with prominent ataxia, hemiparesis or paraparesis, depression, or visual symptoms. [6] Classic symptoms of MS are found in literature as follow: sensory loss which is an early complaint, spinal cord motor and autonomic symptoms, cerebellar symptoms (manifested as Charcot triad of dysarthria, nystagmus and intention tremor) and optic neuritis. [7] Besides neurological abnormalities, constitutional and psychological symptoms may occur. Also, less common manifestations such as seizure, aphasia and other paroxysmal symptoms have been reported with less than 5% frequency. [8,9] Due to highly variable neurological manifestations, neurologists should always consider other possible diagnosis, such as spinal cord neoplasms, acute disseminate encephalomyelitis (ADEM), Schilder disease, sarcoidosis, cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL), transverse myelitis, as well as infectious processes of spinal cord and underlying

collagen vascular disease involving CNS vasculature. [10,11,12] MS is diagnosed based on combination of neurological abnormalities, as well as imaging modalities combine with blood tests and CSF analysis. Also, the 2010 McDonald criteria allow diagnosis of MS even with a first clinical episode. Plaque enhancement on cerebral hemispheres as well as in nerve tracts and basal ganglia and in cerebellum is highly appreciated on conventional MRI, since other neuro-imaging modalities such as Computed Tomography (CT) scan and ultrasonography of the cranial fossa will not help physician's capabilities. [13,14] Also, other techniques such as evoked potentials and electroencephalography (EEG) are other techniques used in diagnosis of MS. We have found that patients in MS who referred to our neurology clinic, exhibit ocular manifestation as disc atrophy followed by optic neuritis, retrobulbar neuritis and also papillitis as their most common ocular manifestation and these symptoms should promote physician's attention to suspect MS as the underlying disease. Also, we have found that geographical and demographic data are strongly correlate with these symptoms.

5. Conclusion

Patients with MS may have various presentations of neurological abnormalities, which ocular manifestations is one of the most important and initial warning signs. We have found that optic disc atrophy and optic neuritis are among the most common presentations of MS, and neurologists should consider demographic and geographic parameters of patients.

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